**Ewww, is that Mold?**

**Materials for Each Group: Materials on Table for Use in Lab:**2 Slices of Bread Spray bottle  
Ziploc Bag  
Sharpie

**What is mold?**On a warm afternoon just after Spring break, a group of 8th graders arrived at Science class and began to settle down for their last class of the day. As they would be dismissed for the day at the end of class, book bags were in tow, and the children were getting their pencils out. As I walked by one group, a boy was retrieving his pencil from deep in his bag, and as he did so, a sandwich in a flip-top baggie tumbled out. Immediately a chorus of "Ewwww", "Yuck", "Disgusting", and "Nasty" went up, and all the students gathered around to get a look. Apparently the bologna and cheese sandwich had spent its Spring break in the book bag, and was covered with several kinds of fungi.

Teachers always tell students the importance of washing hands to prevent transmission of germs and disease. However, the effects of washing to curtail this transmission are never immediately apparent to us, other than our hands looking and smelling clean. Air-born particles and their role are usually not considered.

We live at the bottom of an ocean of air which contains many different particles, most invisible to the naked eye. One common type of air-born particle is called a **spore**. When spores land on a suitable surface, under the right conditions, they can germinate to produce molds. There are four common types of molds. They are green, blue, black, and water molds. **Bread molds are called Rhizopus nigricans**.

Molds live on foods and liquids of animals and other living and non-living objects. Most molds produce reproductive spores that are very tiny particles. **These spores are in a case or sac called sporangium**. Once the spores mature, this enclosed case opens and the spores spread into the environment. These spores produce **hyphae** that are broken down by the enzymes inside the food or liquid. **In effect, the relationship between the food and the mold is mutually beneficial**. The food provides nourishment to the mold and the mold breaks down the dead, organic matter present, becoming visible to us as it grows.

**The three necessary conditions for successful mold growth are food, water, and moderate temperature**. When these three conditions are met, molds will grow. In this lab the host upon which mold will be encouraged to grow is bread. **Molds need a temperature of about 80 degrees Fahrenheit (room temperature) to do best**. Adequate moisture must be present for optimum growth. Water is needed so that the parts of the cell can interact freely. Light also affects mold growth. **Light is not necessary for mold survival**. Plants need light for survival, but unlike plants, **molds do not photosynthesize**, or make their own food using energy from the sun. In fact, molds tend to grow better in the dark, because strong light can cause them to become dried out, and their spores will not be able to germinate.

Molds are useful since they produce several commonly used drugs. Penicillin is a very famous drug that is derived from molds. A British scientist named Alexander Fleming discovered it in 1928. While working with bacterium he noticed that the bacterium around a mold was dying. This resulted in a new drug called Penicillin that is used to treat bacterial infections.

**Directions:**  
1. Take your bread and find a place in the classroom, hall, etc. and wipe an area in that place with a slice of bread.  
2. Spray your bread once or twice with the water bottle.  
3. Place in a Ziploc bag  
4. Take a Sharpie and write your group’s name on the bag.  
5. Place the bag under the sink in the utility closet.

Our group wiped our first piece of bread \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .  
Our group wiped our second piece of bread \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

**The Yuck Factor – shade in the appropriate number after 4 days**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bread Not Sprayed** | 0 - no mold growth | 1 = Little amount of mold (a spec, a dot) | 2 = Some mold growth (partially covered bread) | 3 = Lots of mold growth (mostly covered, pretty bad) |
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**The Yuck Factor – shade in the appropriate number after 6 days**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bread Not Sprayed** | 0 - no mold growth | 1 = Little amount of mold (a spec, a dot) | 2 = Some mold growth (partially covered bread) | 3 = Lots of mold growth (mostly covered, pretty bad) |
| **Bread Sprayed** | 0 - no mold growth | 1 = Little amount of mold (a spec, a dot) | 2 = Some mold growth (partially covered bread) | 3 = Lots of mold growth (mostly covered, pretty bad) |

**The Yuck Factor – shade in the appropriate number after 10 days**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bread Not Sprayed** | 0 - no mold growth | 1 = Little amount of mold (a spec, a dot) | 2 = Some mold growth (partially covered bread) | 3 = Lots of mold growth (mostly covered, pretty bad) |
| **Bread Sprayed** | 0 - no mold growth | 1 = Little amount of mold (a spec, a dot) | 2 = Some mold growth (partially covered bread) | 3 = Lots of mold growth (mostly covered, pretty bad) |

Homework:

**Use the written information at the front of this lab sheet to answer the questions below.**

1. What on what things have you seen mold growing before?

2. How many days do you think it will take the mold to be clearly visible on the bread in this lab?

3. Spores mostly travel through water and \_\_\_\_\_\_\_\_\_\_\_.

4. What are bread molds called?

5. What are the three necessary conditions for mold to grow?

6. What role does moisture play in the growth of mold?

7. Light is not necessary for mold to survive. Why?

8. What is Penicillin used for?

9. Which traits are shared by all fungi?  
 a. Eukaryotic, with cell walls; heterotrophs with similar means of   
 feeding; spores for reproduction  
 b. Prokaryotic; homotroph with different means of feeding  
 c. No spores, spores travel through bees

10. What is the major role of fungi in nature?   
 a. they are important decomposers and recyclers  
 b. they are warning signs for animals  
 c. they help make bread